

# Aging of the Population of a City and Its Implications for Hospital-Based Services: the Example of Tel Aviv-Yaffo

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## Synopsis .....

*The Tel Aviv (Israel) Medical Center serves an area with 270,000 residents, more than 20 percent of whom are over 65 years of age. This high proportion of elderly patients and increasing costs of hospitalization have prompted the center to develop alternative health care services that have made it possible for a number of aged patients to remain at home and ambulatory. Two such alternatives to hospitalization—the center's Day Care Clinic and Home Care Clinic—are described and estimates of savings in hospitalization costs are presented.*

THE CITY OF TEL AVIV is the first Jewish city developed in recent times. It began as a small suburb of Yaffo in 1909. In 1948 it merged with Yaffo and became the city of Tel Aviv-Yaffo (T.A.). During the same period, several other communities and townships developed and their boundaries merged with T.A. to form the metropolitan area of Tel Aviv. This process has had profound effects on demographic, economic, health, and other factors of the life of the people in the city.

In 1948, T.A. constituted the largest urban concentration of people in Israel, with 248,000 citizens (28.4 percent of the nation's population) living within its municipal area. In recent years, this trend has changed. In 1961, the population of T.A. was 386,000 (17.7 percent of the nation's population); in 1981, the population of T.A. had declined to 329,000 (only 8.3 percent of the total population) (1). During the same period, the sub-

urbs of the metropolitan area developed around the core of the city. The growth of this inner ring around the core between 1972 and 1981 is shown in table 1.

As in many other places, the people who moved out of the city to the suburbs were mainly the young. Thus, the city became the residential area of the elderly. At the same time, it became the center of business, tourism, culture, recreation, and so on. Growing numbers of people now spend their active hours in the city but live in the surrounding communities or even in remote areas of the country. The result of this process is an aging of the population, mainly in the oldest, inner quarters of the city.

The map shows the distribution, in 1976, of the elderly within the T.A. municipal area. At that time, the elderly population constituted 15.9 percent of the total population of T.A. The proportion of elderly persons had already reached 18 percent in 1981 (1). The Tel Aviv Medical Center (TAMC) serves 270,000 people (area A). The hospitalization (catchment) area of the TAMC includes most of the "aging areas" of the city. Currently, more than 20 percent of the people in this area are over 65 years of age (2).

The TAMC is the only hospital system in this area. It consists of three hospitals (Ichilov, Rokach, and Hakiryamaternity) that are affiliated with the Sackler Medical School of the Tel Aviv University. The trends in hospitalization in the TAMC are shown in table 2. As can be seen, there was an overall decrease in the number of hospital beds and an increase in the number of "day care" beds. While there was a progressive increase in the number of patients, there was a decrease in the total number of days of patients' hospitalization and in the

Table 1. Population (in thousands) of Tel Aviv-Yaffo metropolitan area

Metropolitan area	1972	1976	1981
Core:			
Tel Aviv, Yaffo .....	363.8	348.5	329.5
Inner ring:			
Ramat Gan, Holon, Azor, Bat Yam, Benei Berak, Givatayim ..	445.7	449.6	532.1
Outer ring .....	279.4	352.6	427.2
Total .....	1,088.9	1,200.7	1,288.8

SOURCE: reference 1, p. 108.

Table 2. Trends in hospitalization at the Tel Aviv Medical Center

Selected measures	Year				
	1976 <sup>1</sup>	1979 <sup>2</sup>	1981 <sup>3</sup>	1982 <sup>4</sup>	1983 <sup>5</sup>
Hospital beds.....	983	981	910	912	912
Day care beds.....	35	35	67	77	77
Patients discharged.....	37,308	37,648	40,902	42,274	42,128
Hospital days.....	286,553	284,858	303,925	297,605	288,418
Mean hospital stays (days).....	7.6	7.6	7.4	7.1	6.9
Mean stay (days) for patients of department of internal medicine.....	9.4	8.8	9.1	7.5	7.0
Hospital occupancy (percent).....	79.4	83.0	91.5	91.5	87.0

<sup>1</sup> April 1976 to March 1977.<sup>2</sup> April 1979 to March 1980.<sup>3</sup> April 1981 to March 1982.<sup>4</sup> October 1981 to September 1982.<sup>5</sup> October 1982 to September 1983.

SOURCE: Hospitals in Israel, published yearly by the Ministry of Health, Jerusalem, Israel, 1977 through 1981.

duration of hospital stays. This trend was more accentuated in the department of internal medicine.

The changes in the distribution of hospital beds among the most significant services are shown in table 3. The decline in number of beds for pediatrics and obstetrics coincides with an increase for such specialties as geriatrics, urology, and cardiac surgery. The decrease in number of beds for internal medicine and general surgery coincides with an increase for the subspecialties (which are not shown in this table), but it also reflects the shortening of the mean hospital stay and the increase in rate of occupancy of beds.

The age distribution of TAMC patients on three services (medicine, surgery, and orthopedics) in 1979 is shown in table 4. Table 5 shows the typical difference in mean age of patients at the TAMC (in the city) when compared with patients at Sheba Medical Center (inner ring) and Assaf-Harofe Hospital (outer ring). The age

Table 3. Distribution of hospital beds among the major services at Tel Aviv Medical Center

Service <sup>1</sup>	Year		
	1978	1980	1982 <sup>2</sup>
Internal medicine.....	422	340	356
General surgery.....	144	134	106
Cardiac surgery.....	...	...	21
Orthopedics.....	45	35	35
Urology.....	30	35	35
Neurosurgery.....	18	24	24
Obstetrics.....	100	80	80
Neonatal intensive care.....	24	30	30
Geriatrics and rehabilitation.....	20	48	48
Pediatrics.....	84	54	48

<sup>1</sup> Not all services are listed.<sup>2</sup> Based on Tel Aviv Medical Center statistical reports.

SOURCE: For 1978, Hospitals in Israel, Ministry of Health, Jerusalem, Israel, 1979. For 1980, Hospitals in Israel, Ministry of Health, Jerusalem, Israel, 1981.

Table 4. Age distribution of patients discharged from three major services at Tel Aviv Medical Center, 1979

Age (years)	Service					
	Medicine		Surgery		Orthopedics	
	Number	Percent	Number	Percent	Number	Percent
0-14.....	39	0.34	403	7.27	116	8.80
15-29.....	662	5.75	679	12.25	236	17.91
30-44.....	693	6.02	780	14.07	148	11.23
45-54.....	1,095	9.52	688	12.41	134	10.17
55-64.....	2,119	18.41	979	17.67	193	14.65
65-74.....	3,898	33.88	1,292	23.31	269	20.45
75 and older.....	3,001	26.08	721	13.02	220	16.79
Total.....	11,507	100.00	5,542	100.00	1,316	100.00

SOURCE: Statistical Yearbook No. 20, Center for Economic and Social Research, Tel Aviv-Yaffo Municipality, Israel, 1980.

Table 5. Mean age (years) of patients on three major services at Gush Dan hospitals, 1979<sup>1</sup>

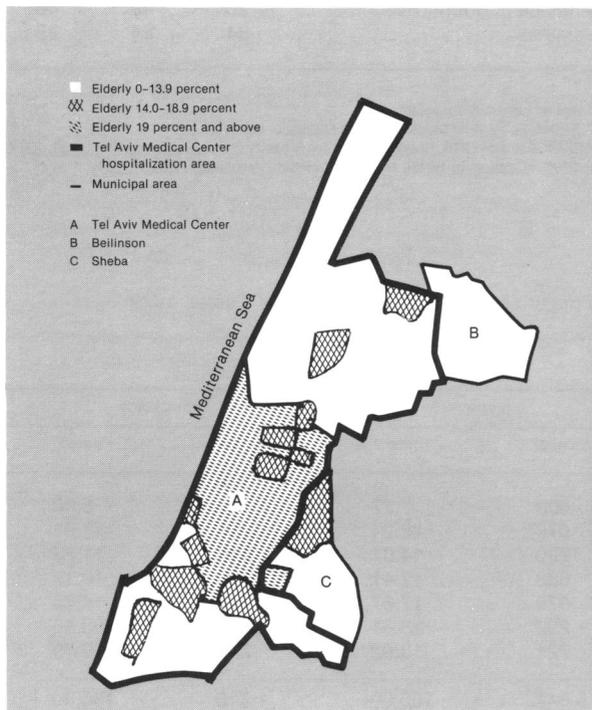
Hospital	Service		
	Medicine	Surgery	Orthopedics
Tel Aviv Medical Center . . . .	67.5	56.5	56.0
Sheba . . . . .	61.1	46.0	30.3
Assaf-Harofe . . . . .	52.7	38.4	28.0

<sup>1</sup> Based on monthly statistical reports of the Ministry of Health, Jerusalem, Israel, 1979.

Table 6. Distribution of patients treated by the Home Care Clinic of Tel Aviv Medical Center, 1982, by reason for treatment

Reason for treatment	Home care patients	
	Number	Percent
Malignancy . . . . .	158	37.0
Cerebral accident . . . . .	77	18.0
Cardiac disorder . . . . .	64	16.0
Peripheral vascular disorder . . . . .	20	5.0
Parkinson's disease . . . . .	23	6.0
Degenerative neuromuscular disorder . . . . .	18	4.0
Respiratory disorder . . . . .	9	2.0
Rheumatology . . . . .	11	2.5
Postoperative care . . . . .	11	2.5
Other . . . . .	31	7.0
<b>Total . . . . .</b>	<b>422</b>	<b>100.0</b>

Distribution of elderly persons (over 65 years) within the Tel Aviv-Yaffo municipal area, 1976



SOURCE: reference 2, p. 53.

distribution of the patients in each hospital reflects the age distribution in the community the hospital serves.

### Alternative Hospital-Based Health Services

The developments described previously have prompted the TAMC to look for alternatives to the “hospital bed,” since enabling aged patients to remain at home and ambulatory is important for their mental, social, and physical health. Also, the increasing costs of hospitalization make it imperative that less expensive ways of delivering health care to the aged and the chronically ill be used.

Since, in our particular situation, the hospital is the strongest health care facility in the community, it is logical to develop alternative services from within it. There can be parallel community-based (or “primary care”) services. However, because—especially for the old and crippled—the hospital-based services are more easily accessible as well as available within a single facility, this choice is one that many patients would prefer.

Alternative services within the hospital make use of the existing infrastructure and additional services at minimal extra cost. Thus, this approach is both economically and medically sound for any hospital that can and will undertake it.

At the TAMC, two services serve as alternatives to hospitalization: the Day Care Clinic and the Home Care Clinic.

**The Day Care Clinic.** The day care beds are deployed by each of the specialized clinics. This is different from some other hospitals where there is a day hospital and all the patients are under the care of a single team of physicians and nurses. The advantages we find in our method are:

1. There is no need to make special arrangements with different specialists for patients' appointments and treatments. Usually, the patient is already under the care of a single specialist, who takes care of appointments directly with the patient without intermediaries. It is comfortable for the physician to sit in his office and see other clients while the patient is being taken care of by the nurse in an adjacent room. The doctor can easily go back and forth from his office to the patient's room and intervene in treatments as needed. This saves time for the specialist and makes all the arrangements much more simple.
2. We do not have special wards for most of our specialists, and when they hospitalize their patients it is done in the department of medicine. The arrangement of the day care beds in the different clinics compensates for the need of the specialists to have beds where they can operate more independently.

3. One special area of ambulatory care and day care is that of general and internal medicine. In Israel, the departments of internal medicine do not operate consultative clinics; they only have followup clinics. Therefore, when a physician from the community refers a patient to the hospital, the patient is usually sent to the emergency room. The result is overcrowding of the emergency room and overutilization of the hospitalization facilities.

In 1980, we started to operate the "department of day care of internal medicine," which has 15 beds and which operates its own consultative service for referred patients. This unit was only recently recognized by the Ministry of Health. In 1981, the unit had 8,649 visits, of which 25–30 percent were for "day hospitalization." The unit now has an average of 720 visits a month, with something like 200 day hospitalizations a month. We believe that we have in this way reduced the number of hospitalizations in the wards.

**The Home Care Clinic.** This service is another way to reduce the number of hospitalizations while taking care of chronically ill patients in their homes. The unit is run by five full-time employees: a physician, a nurse, a social worker, a secretary, and a telephone operator. The unit also employs, on a "fee for service" basis, 12 physicians, 6 physiotherapists, 3 occupational therapists, 1 clinical psychologist, 1 speech therapist, 5 liaison nurses, and 5 volunteers for general tasks.

In 1982, the unit supplied 1,750 "home care months" and took care of 425 patients, who received 21,200 treatments. It must be realized that many of the patients are in a constant state of deterioration. The categories of care are grouped as follows: general examinations and treatments (18 percent), acute situations (35 percent), terminal malignancies (10 percent), various infusions (17 percent), continuing orthopedic care (7 percent), and others (13 percent). The patients in the unit had a variety of chronic and malignant disorders (table 6).

The duration of care given by the Home Care Clinic was 1–2 months in 46 percent of cases, 3–6 months in 31.5 percent, 7–9 months in 12 percent, and 10 months or more in 10.5 percent. Patients stopped being cared for by the unit because care was no longer needed (48 percent of cases), because of transfer to another type of care (24 percent), or because of death (28 percent).

The economic benefits of the program were estimated by the following method. The total list of patients at a given date was examined, and an evaluation of the condition of the patients was done. At the end of 1983, we estimated that of the 160 patients enrolled at the time, 31 (19.4 percent) would have had to be hospitalized that same day had they not been under treatment by the home

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care unit. This estimate was very close to two studies we had performed the preceding year. If we can assume that this is the situation all year long, the program saves us 31 hospital beds—which in December 1983 (the "cost per bed" being 7,500 Israeli shekels per day) was equivalent to 84,862,500 shekels per year (about US\$900,000). In January 1984, the estimated "cost per bed" was increased by the Ministry of Health to 14,000 shekels per day, which would bring the cost for 31 beds per year to US\$1,300,000.

The costs of running the home care unit for the year, including salaries, house calls, medicines, medical equipment, and office expenses, were US\$400,000. Subtracting this total from the estimated figures for savings on hospital beds yields a net saving of \$500,000 for the year at December 1983 prices and \$900,000 at January 1984 prices—a saving of 38–69 percent. The difficulty is that we have no estimate of the real cost of a hospital day; nevertheless, this is a very substantial saving.

In reality, the value of this operation is much greater than the mere saving of 31 hospital beds. At the time of our last study, it was enabling a whole group of 160 patients to stay at home, be well cared for in familiar surroundings, and enjoy a better quality of life. We do not know how many of these people would have been confined to homes for the aged if they had not been included in this program.

## References .....

1. Statistical yearbook No. 22. Center for Economic and Social Research, Tel Aviv-Yaffo Municipality, Israel, 1982.
2. The population of T.A.-Yaffo in the 1970's. Center for Economic and Social Research, Tel Aviv-Yaffo Municipality, Israel, 1978.